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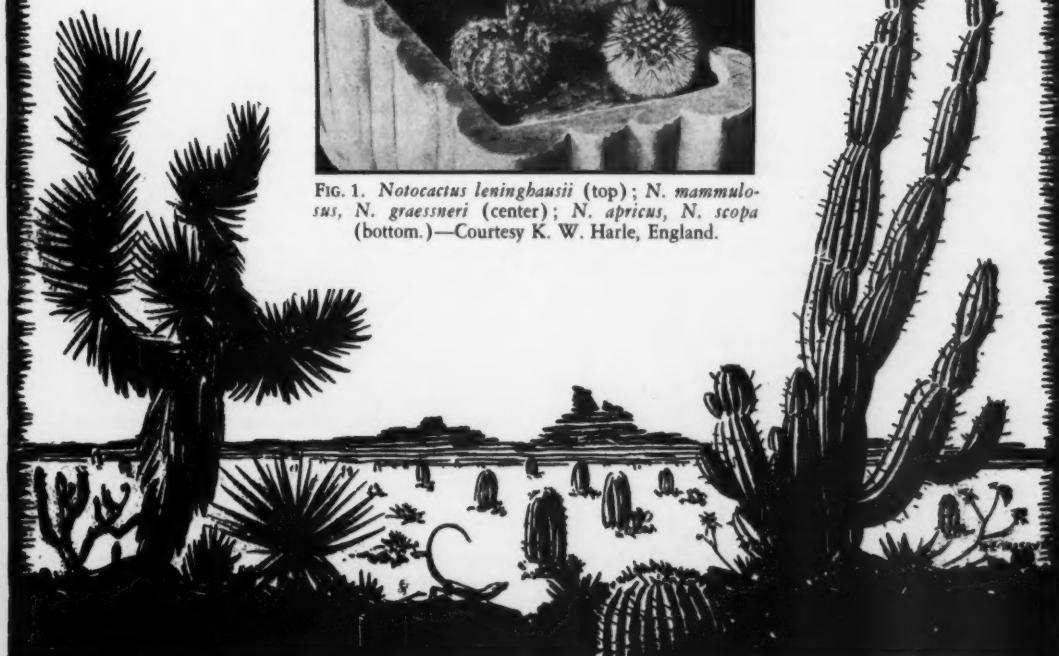
CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society
Of America

Vol. XXV JAN.-FEB., 1953 No. 1



FIG. 1. *Notocactus leninghausii* (top); *N. mammulosis*, *N. graessneri* (center); *N. apricus*, *N. scoparia* (bottom).—Courtesy K. W. Harle, England.



CACTUS AND SUCCULENT JOURNAL

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1953 CONVENTION FIELD TRIP

Even though our Convention sessions will be held in Arcadia at the western foot of the mountains where the summer climate is usually as pleasant as any place in our country, we will have a chance to visit the real desert after the formal sessions.

The first stop on this desert trip will be at one of the world's largest cactus and succulent nurseries where plants are growing by the million. In the open fields, long rows of mother plants are grown like vegetables on a truck garden farm. Luncheon will come in Riverside, where the orange groves crowd the new subdivisions. Then on over the Jack Rabbit trail past March Air Base to the pass at Beaumont which divides the coastal area from the desert to the Devil's Garden on the southeastern toe of Southern California's highest mountain. From there it is truly a desert trip through mountains and valleys to Twenty-nine Palms where comfortable air-cooled cabins will be ready for us. Twenty-nine Palms is higher than most of the desert and the air may be nippy enough to make the camp fire a good place to hold a liar's story telling contest.

The following morning will be spent partly on a tour through the grotesque tree yuccas of the Joshua Tree National Monument. A number of interesting cactus are scattered around through the rock formations. When the sun begins to get high we will head for lush gold plated Palm Springs where cool drinks and luncheon will be waiting for us. This is the home town of our Gracious Queen Patricia. It's a beautiful place any time of the year. After lunch we will have time for a visit to the forest

of fan palms beside the murmuring stream in Palm Canyon, before returning to Arcadia.

It is expected that most of us will prefer to make this desert trip in specially chartered busses even though provision will be made for those who wish to drive their own cars and depart for home from Palm Springs rather than travel the more than hundred miles back to Arcadia.

Be sure to mark down the dates. Convention at Arcadia, California, July 10-12. Field trips to Santa Barbara and the desert July 13-15, 1953.

HOWARD E. GATES

EDITOR'S NOTE

This year of 1953 appears to be one that will make cactus history. Interest in cacti and the other succulents has been at a low ebb in this country since World War II but there are decided indications of renewed enthusiasm. There is a definite trend in scientific study and the rebuilding of real collections. There is also an enthusiastic group of amateurs whom we must encourage by reviewing the information and experiences that many of us have experienced during the last twenty-four years. We should all work together and take an active part in the JOURNAL so it can start its twenty-sixth years as a monthly magazine in 1954.

The newcomers will question pages 13-16 of this issue. They are part of a reprint of Schumann's "Bluhende Kakteen" and consists of reproductions from rare color plates published fifty years ago. Some readers remove these sections and assemble them consecutively. The last section was in Vol. XXII, page 180. This series will be continued if there is sufficient interest.

Be sure to remove the Index to Vol. XXIV from the center of this issue and keep it with last year's numbers so that another year they may be bound.

Your Editor appreciates the many expressions of greetings received this last thirty days and they are compensation in full for his twenty-four years of editorship.

SCOTT E. HASELTON

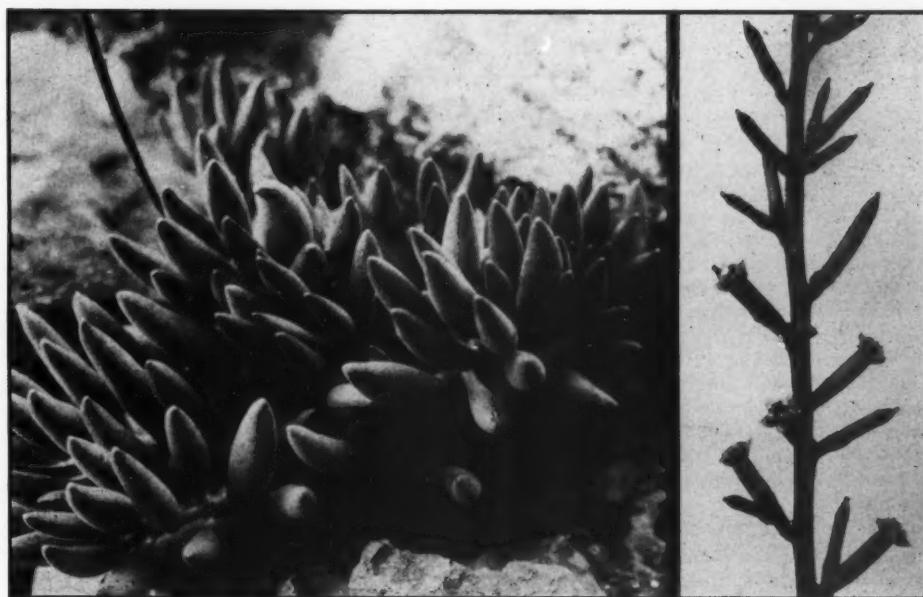


FIG. 2. *Adromischus mamillaris* (L.f.) Lem., UCBG No. 50.1714, ca. 0.6 x. Leaves appear white due to reflection but are actually grey-green. Right: Flowers of same plant, nat. size.

STUDIES IN THE CRASSULACEAE

2. *Adromischus mamillaris* (L.f.) Lemaire

By P. C. HUTCHISON*

This is the first of a series of proposed studies on the genus *Adromischus* Lemaire, which, it is hoped, will clarify the identity of some of the inadequately known species and bring to the attention of students of this group some previously undescribed species. This genus may be highly polymorphic, as is its closest ally, *Cotyledon*. Polymorphism is immediately apparent in some species when a large number of specimens are available for study, such as are in cultivation at this botanical garden. The nature and extent of polymorphism in the genus as a whole apparently has not been investigated, so that a number of species may prove to be less distinctive than presently supposed. In order to facilitate further botanical investigation of them, the members of the genus treated in this series will be photographed and drawn; four or more herbarium sheets of each collection will be made as material is available and will be deposited together with separates of the respective article, at the University of California Herbarium

(UC), Bolus Herbarium, Cape Town (BOL), National Herbarium, Pretoria (PRE) and Kew, England (K). Material studied will be grown in several locations, so that phenotypic variation can be studied.

Adromischus mamillaris (L.f.) Lem. has been largely misinterpreted for many years; with few exceptions references to, and photographs of it in botanical and popular literature are referable to other species. Karl von Poellnitz (5) presented an excellent description with photographs of this species, but his interpretation of two of the entities which he reduced to synonymy under it is not yet fully clarified. Thus, von Poellnitz considered *Cotyledon filicaulis* E. & Z., *C. Marlothii* Schönl., and *C. fusiformis* Rolfe to be members of this species. Berger (1) and Smith (4) treated *Adromischus Marlothii* (Schönl.) Berg. as a separate species although Schönland (3) reduced this species (described by himself) to synonymy under *A. mamillaris*. Smith (l.c.) considered that *A. filicaulis* (E. & Z.) C. A. Smith was distinct. Von Poellnitz considered Baker's treatment and

*University of California Botanical Garden (Berkeley) Contribution No. 127.

plate of *Cotyledon mamillaris* L.f. in Curtis's Bot. Mag. 99: pl. 6020, 1873, to be atypical of this species and established *A. mamillaris* (L.f.) Lem. var. *ruber* Poelln. for it. Smith independently reached the same conclusion concerning this plate but considered the differences sufficiently great to establish the new species *A. kleinoides* C. A. Smith.

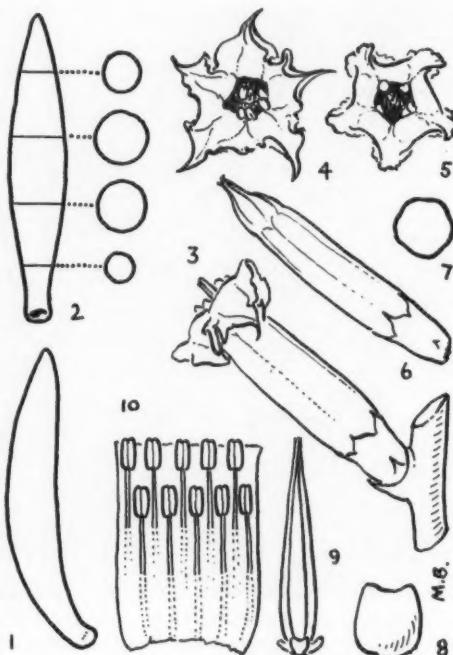
Cotyledon fusiformis Rolfe was described primarily because the plants on which it was based differed from the illustration in the Bot. Mag. pl. 6020, which Rolfe presumed to be typical of *A. mamillaris*. Rolfe's description, however, appears to be fairly representative of *A. mamillaris* as interpreted by all of the above authors. From the published descriptions of *A. filicaulis* and *A. Marlothii* it seems doubtful whether they are distinct from *A. mamillaris*, although Smith (l.c.) did examine the types and conclude that they were distinct. Apparently, however, Smith had not observed the polymorphy which Poellnitz (l.c.) describes in some detail.

Adromischus mamillaris has a wider geographical distribution than any other species of the genus. It has been collected at stations from Oudtshoorn, west through the Great Karoo, north to South West Africa about 30 miles south of Aus, and, in its northern range, inland as far as Nieuwefontein in Distr. Warmbad and Aaalwynsfontein in Namaqualand. Inclusion of *Cotyledon Marlothii* in this species would extend the northern limits of its eastern distribution in west Cape Province to Laingsburg. This range will probably be considerably increased by future collections; doubtless the species will eventually be reported in intermediate Districts of Cape Province from which no collection of it has as yet been recorded.

Adromischus mamillaris (L.f.) Lem., Jard. Fleur. II, Misc. 60, 1852.

Cotyledon mamillaris L.f., Suppl. 242, 1781
Cotyledon fusiformis Rolfe in Kew Bull., 229, 1916

Stem prostrate, rooting at the nodes, adscendant towards the tip, 5 to 18 mm. diam., irregularly terete, brownish. Leaves alternate, spirally arranged, adscendant, those on the underside of the stem soon lost, subfusiform, 2.5 to 5.5 cm. long, 0.7 to 1.0 cm. maximum diameter, round in cross-section from base to apex, apex obtuse or subacute, broadened at the petiolar part, dull green with many obscurely grey-green wax points, old leaves often grey-green with brownish coloring subapically. Scape up to 40 cm. long, erect, simple, or rarely once-branched, the lower third to half with 4 or 5 sterile bracts, brownish green to somewhat glaucous purple. Pedicels 1 to 3 mm. long, purplish or green, 1-



Adromischus mamillaris (L.f.) Lem. 1. Leaf, side view. 2. Leaf, top view and transverse sections. 3. Flower, side view. 4. Spread limb, top view. 5. Reflexed limb top view. 6. Bud, side view. 7. Outline cross-section mid-tube. 8. Squamae. 9. Carpels. 10. Stamen insertion. 1, 2, nat. size; 3-7, 9, 10, 3 x 8, 9 x.

to 3-flowered, flowers angled upwards 45° from the vertical. Calyx green, lobes adpressed, deltoid-acuminate, 1 mm. long and broad. Perianth tube 0.7 to 1.0 cm. long, green inside and out, rounded-pentagonal in cross-section, straight or slightly curved, 3 mm. diam., slightly narrowed apically and sometimes centrally, limb spreading then reflexed against tube, violet or maroon, lobes (cf. final paragraph) ovate-deltoid, acuminate, slightly concave, ca. 3 mm. long and broad or slightly broader, darker violet centrally, lighter on margins, margins raised to erect and forming a pleat at sinuses. Stamens didymous, inserted ca. middle of tube, slightly exserted, anthers obovoid, yellow, filaments greenish, the upper series stouter, 3.5 to 4.0 mm. long, the two series ca. 2 mm. apart. Carpels slightly constricted subapically, styles included, later slightly exserted or, rarely, strongly exserted. Squamae squarish with somewhat rounded corners, apex slightly emarginate, concave on the inner face, yellowish white or white. Chromosome number: n=18.

South Africa, Cape Province, Calitzdorp, leg.

T. J. C. Kleyn No. 10, Univ. Calif. Bot. Gdn. No. 50.1714, hort., pressed by P. C. Hutchison, voucher (BOL, K, PRE, UC).

This is the first tetraploid reported in *Adromischus*. I am indebted to Mr. A. Irving of Alameda, California, who obtained this plant from Mr. Kleyn and who brought it to my attention and to Dr. C. H. Uhl of Cornell University for permission to publish the chromosome number.

The strongly reflexed perianth limb with a conspicuous pleat at the sinuses seems to be typical of a number of species of *Adromischus*. It is somewhat difficult to differentiate limb and lobes in this type of flower since the lobes as delimited by the pleats are not cut at the sinuses. When a spread limb is pressed the pleats may flatten out and a pentagonal limb is formed with a small lanceolate projection at each of the five corners. But usually, even when the limb is

spread rather than reflexed, the incurved margins and the formation of pleats gives the appearance of lobes. In the reflexed position as viewed laterally, these false lobes are very conspicuous and well-defined. In this and subsequent descriptions of species of *Adromischus* with flowers of this type, lobe shape and dimensions refer to the outline of the unflattened false lobes as viewed laterally. This arbitrary device appears to be the only way the limb can be described to provide data of use to one working only with dried material.

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1. Berger, A. in Engler, Nat. Pflanzenfam. 18a: 416, 1930.
2. Schönland, S. in Records Albany Museum 1 (1): 59, 1903.
3. Schönland S. in Records Albany Museum 3 (2): 153, 1915.
4. Smith, C. A. in Bothalia 3 (4): 613-654, 1939.
5. von Poellnitz, K. in Desert Plant Life 10 (6): 112-114, 1938.

QUESTION

Could you assist a newly enrolled member and name a plant which has, so far, remained anonymous in spite of all the efforts I have made on its behalf?

I received it in March, 1950, from a dealer, who sold it to me as *Euphorbia suzannae* saying, the plant had been 'vetted' by Mr. Herre before being passed on to him. I had my misgivings about the name and told him so. The tubercles of this plant are long and slender, those of *E. suzannae* short and conical. This

plant bears a hair at the tip of each tubercle, *E. suzannae* does not. *E. suzannae* produces pups, this plant, so far, does not. The only thing they have in common is, that they both grow very slowly and that they both have milky juice, but that does not necessarily make the unnamed plant a *Euphorbia*. I have looked for starch granules but did not find any. Although this plant was kept under good conditions in a hothouse it only started growing in July.

DR. E. ELKAN, England



FIG. 4. Left: *Euphorbia suzannae* as grown by E. C. Hummel. Right: Dr. Elkan's photo of a plant that appears to be abnormal. Does anyone recognize this particular plant?





FIG. 5. Left: Rooted fruit of *Opuntia monacantha*. Note new branches growing from the fruit.

Unusual Powers of Regenerations in Certain Succulents

By H. TEUSCHER

Curator of the Montreal Botanical Garden

The special adaptations of succulent plants to very austere conditions of life—responsible by the way for their often bizarre shapes so fascinating to their fans—seem to have endowed many of them also with an extraordinary ability to save themselves in case of injury, so that a misfortune may be turned into an advantage. More than with any other types of plants their tissues apparently manage to retain the embryonic power of developing along different functional lines as the occasion warrants in the interest of preserving or of propagating the species.

The facility with which the leaves of many succulent plants, broken off accidentally, strike roots wherever they fall and develop young plants at their base, is well known. The fact that certain liliaceous succulents, such as some of the Gasterias and Haworthias, produce offsets more readily on their inflorescences than from the base of the plants falls into the same category.

A particularly odd such case was recently observed at the Montreal Botanical Garden, when an unripe *Opuntia* fruit was broken off accidentally and dropped unseen between the pots on the limestone gravel with which the greenhouse bench was surfaced. When it was found

several weeks later, it had made roots on its lower end, and a bud, which was forming on its top, appeared to be ready to produce a growing shoot. After having been potted up, this fruit developed into a normal *opuntia* plant.

In order to test still further this strange ability of a fruit to change its function, fruits of several species of *Opuntia* were planted, and all of them readily produced roots and shoots, provided that they were planted when still entirely green. When the slightest discoloration of the outside indicated approaching maturity of the fruit, the change-over could no longer be made and the fruit simply rotted, in the end usually containing at least a few fully developed seeds. Within the unripe fruits which rooted, the development of the young seeds was completely arrested, and the embryo seeds appeared to be gradually absorbed by the tissues as the fruit changed into a stem joint.

No claim is made that this observation is original, though the writer has been unable to find mention of it elsewhere and it, certainly, was new to him.

Equally odd is the behavior of *Kalanchoe beharensis* (from Behara, Madagascar), which



FIG. 6. The root of *Kalanchoe beharensis* invading the pot of a Euphorbia.

readily sends out its roots through the drainage hole of the pot, and these roots, creeping along often for quite a distance in the limestone gravel covering the bench, use the first opportunity to enter the pot of another plant, though never that of another Kalanchoe. In its own pot this Kalanchoe does not sucker, but in the pot of the other plant the roots produce so many suckers in a very short time that they become a menace and will take over completely if allowed to do so. The roots sucker somewhat also in the limestone gravel of the bench but never to the same extent as in the pot of the other plant, even

when the latter is thoroughly filled with the roots of its legitimate occupant. This strange behavior, including the fact that the roots appear to avoid entering the pot of any other Kalanchoe, is undoubtedly conditioned by some nutritional factor, but what is the nature of this factor is still obscure.

Kalanchoe orgyalis, likewise from Madagascar, does not sucker from its roots—nor do in fact any of the other Kalanchoes of which we have a good representative collection—however, it shows another peculiarity. The fairly large (6 x 4 inches), oblong, entire and very fleshy leaves may be cut into many pieces—about 1 inch square—and, when placed flat on the surface of soil, each piece will produce a plant. Not along the leaf margin—like the well known *Kalanchoe pinnata* (*Bryophyllum*)—but anywhere on the cut edge of the piece. Even a piece, cut right out of the leaf blade without including either the leaf margin or the central vein, will produce a plant. *K. orgyalis* by the way never produces little plants on its leaves as long as the latter are attached to the plant.

The ability of a piece of leaf or of an unripe fruit—perhaps broken off by a passing animal—to produce a new plant, may well serve to assure the perpetuation of the species under climatic conditions which are so unfavorable that seeds or seedlings perish.

RHIPSALIS CASSYTHA

The quaint appearance of this curious shrub is not altogether devoid of attraction when loaded with its pearly, subpellucid berries, bearing no remote resemblance to Mistletoe fruits. The cylindrical, or rather angular, slender branches are fascicled at irregular intervals along the larger branches, and doubtless lose much of the graceful character they would otherwise possess if furnished with foliage. Owing to this leafless condition they present a uniform sameness throughout the year, except at the flowering and fruiting period. The pale yellow, sessile flowers are arranged laterally on the branches, and certainly deserve the epithet of pretty, by reason of the numerous stamens set in a fascicle of petals gradually merging into, and similar to the sepals. An idea of their character may be gleaned from *R. rhombaea* and *R. crispata*, Brazilian species, flowering alongside of *R. Cassytha* in fruit in the Succulent-house at Kew. The latter is figured in Hooker's *Exotic Flora*, pl. 20, and at one time received the name of *Cactus pendula*. The specific name would not be inappropriate, seeing that in its native habitat the plant is suspended from the branches of trees.—*Gard. Chron. n.s.*, 25: 178. 1886.

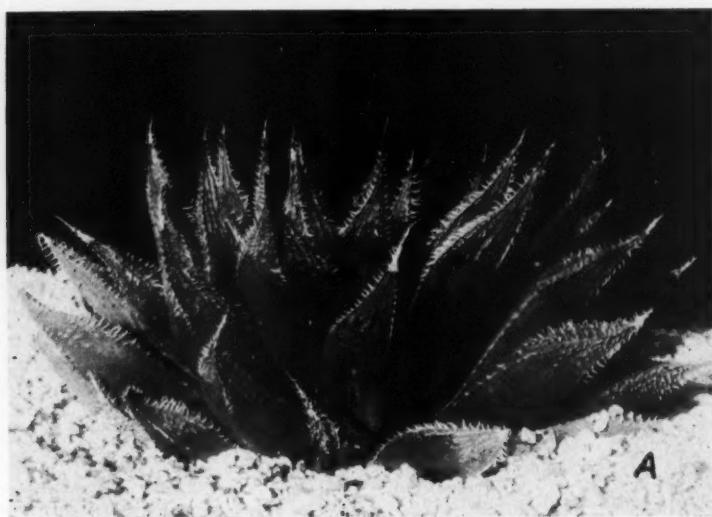


FIG. 7. (A) *Haworthia Rossouwii* Poelln. nat. size.

NOTES ON HAWORTHIAS

By J. R. BROWN

Haworthia Rossouwii Poelln. in Kakteenkunde (1938) 75, fig.

Plant stemless, 8-10 cm. diam.

Leaves erect-spreading, 4.5-5 cm. long, 15-20 mm. broad, broadly-lanceolate, acuminate, bright green, dull, face of leaf flat, convex in the upper part; back of leaf rounded, keeled from the middle or towards the tip, sometimes with 2 keels, with tubercles, somewhat shining flecks and often with some concolorous tubercles in the upper part; the end-area of leaf-face somewhat pellucid about 20-22 mm. long, 15-20 mm. broad at base, triangular, long-acuminate, with shining, pellucid teeth, the teeth usually more prominent towards the margins, and with age, becoming roughened with numerous, concolorous low tubercles, with 3 longer green lengthwise lines and some shorter ones; margins and keel with glistening, sometimes concolorous, to 2 mm. long teeth; end-bristle 5-7 mm. long with distinct, minute side bristles.

Locality: Cape Province: Napier near Bredasdorp.

Named for Mr. Rossouw, a member of the South African Police in Napier.

The description of this Haworthia (sect.

Retusae) by Dr. von Poellnitz seems to be very faulty, as the various dimensions given do not agree very well with his figure of the plant. This, like most of his work, was described from a recently imported plant with the rosette of leaves more or less closed and erect, the diam. being given as 5-6 cm.; the length of the leaves 5-6 cm., however 5 cm. seems to be the more usual length, the breadth of the leaves is given as 8-10 mm., but his fig. clearly indicates a breadth of about twice this.

In age, the end-areas of the face of the leaves become roughened with sub-immersed, concolorous tubercles; the upper part of the back of the leaves may also have teeth arising from some of the tubercles. A somewhat bristly appearing plant which does not seem to be proliferous.

Two plants of this Haworthia are shown here, one of which (A), with more erect leaves than the other, shows the back of the leaves. The other two (B and C) are of another plant, showing the face of the leaves. The photo (B) shows the plant as it was over 10 years ago with comparatively smooth end-areas except for the teeth, the other photo. (C) shows this same plant at the present time with numerous tubercles on the end-areas.

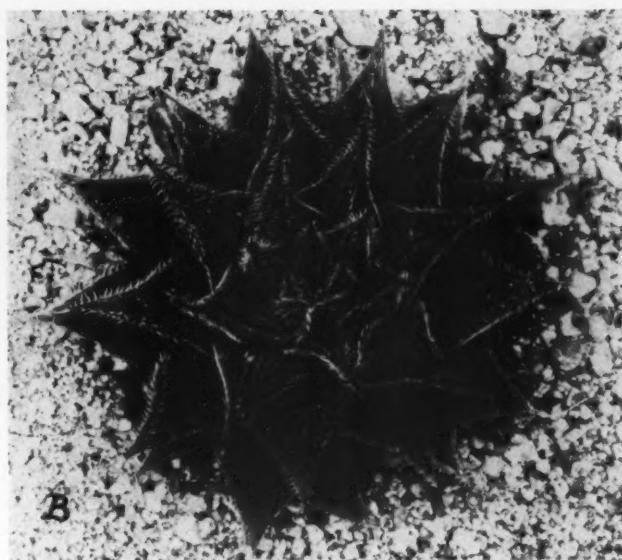


FIG. 8. (B) *Haworthia Rossouwii* Poelln. nat. size.

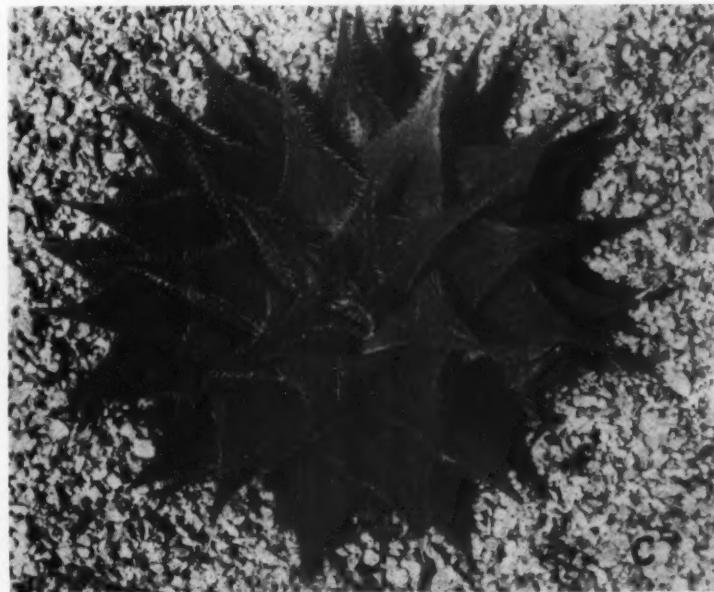


FIG. 9. (C) *Haworthia Rossouwii* Poelln. nat. size.



FIG. 10. *Haworthia retusa* var. *multilineata* G. G. Smith, nat. size.

Haworthia retusa var. *multilineata* G. G. Smith in Journ. So. Afr. Bot. XII (1946) 3, Pl. I and fig. 1.

Plant stemless, with about 12 to 15 leaves, to 8 cm. in diam., not or slowly proliferous from the base.

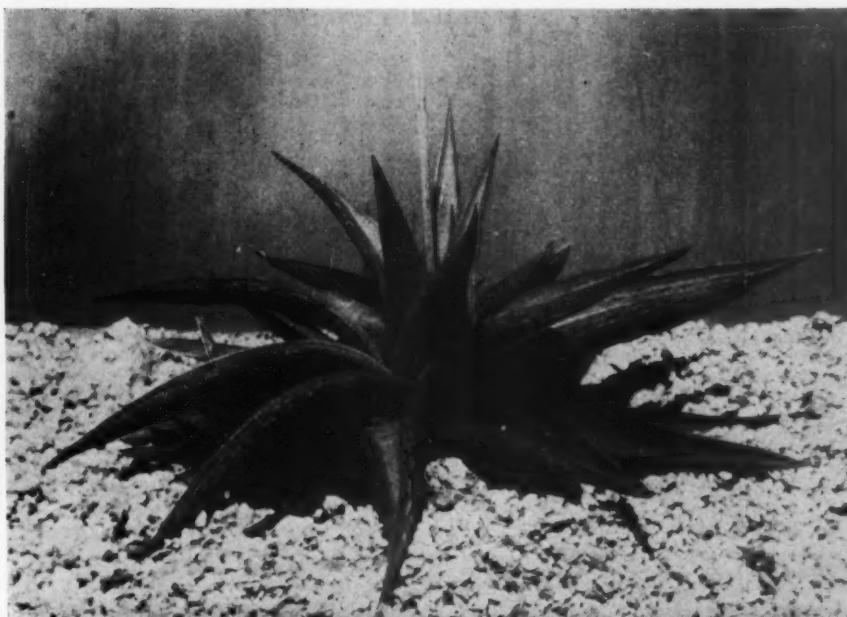
Leaves to 5 cm. long, to 3 cm. broad and about 17 mm. thick at base of end-area; face of leaf below end-area light greenish-brown, dull, smooth, more or less mottled and with fine lengthwise flecks; end-area of leaf about 26 mm. long, to 3 cm. broad, deltoid-acuminate, flat to lightly concave, turgid, greenish-pellucid, somewhat shining, with a few concolorous tubercles, and with from 14-22 longer and shorter pale green lines, the middle line reaching to the tip; back of leaf convex, smooth, light green below increasing to a dark brown at tip, dull, with numerous lengthwise flecks, and with several obscure broad lines alternating with fine ones; keeled in the upper part, smooth, and terminating in a sub-pellucid, more or less persistent bristle to 5 mm. long; margins with very minute teeth in the lower half.

Locality: Cape Province; Riversdale Distr.

This Haworthia of the sect. *Retusae* is quite distinct by the symmetrical rosette of broad leaves and the numerous lines on the pellucid, retused faces of the leaves.

In cultivation at least, it may attain a diam. of 10 cm. and the leaves may be 2 cm. thick at base of end-area; the sub-pellucid, whitish end-awn is from 3-5 mm. in length. It will also be noted that the plant illustrated here has many concolorous tubercles on most of the pellucid end-areas of the leaves, instead of only a few tubercles, the tubercles varying in number from leaf to leaf. The color of the leaf-tip intensifies in the colder season and the uppermost parts of the longer green lines on the end-area also turn brownish in color.

The plant shown in the photograph of this Haworthia was collected about 2 miles from Riversdale on a dry slope, where it grows amongst the stems of Rhenoster bushes, (*Elytropappus* sp.) and partly in the open. The top of the leaves being level with the soil, thus being difficult to find and is not very numerous.

FIG. 11. *Haworthia ubomboensis* Verdoorn, nat. size.

***Haworthia ubomboensis* Verdoorn in Flwg.**
 Plts. So. Afr. XXI (1941) Pl. 818. *Haworthia limifolia* var. *ubomboensis* (Verdoorn) G. G. Smith in Journ. So. Afr. Bot. XVI (1950) 3.

Plant stemless, with a rosette of leaves 10-12 cm. diam., proliferous by means of short, somewhat slender rhizomes.

Leaves to 20 or more, ovate-lanceolate, acuminate, 3-6 cm. long, 12-20 mm. broad, 2 mm. thick, erect-spreading, the older leaves more or less recurving; face of leaves concave, with obscure lengthwise lines, smooth or with a few, scattered concolorous tubercles; back rounded, inconspicuously and obliquely keeled, more or less obscurely lined and with concolorous tubercles arranged in lengthwise rows, the tubercles sometimes united in shortly oblong series, especially towards the margins; margins entire with a very narrow cartilaginous edge; leaf-tip ending in a short sub-pellucid point.

Locality: Swaziland; Ubombo Mtns. near Stegi.

An interesting Haworthia of the sect. *Limifoliae*. The tubercles which are never arranged in transverse rows, but are irregularly arranged lengthwise, the recurved older leaves and the color would seem to be distinctive enough to retain this plant under its specific name. The color of the plant shown in the illustration has

gradually become of a pale reddish-brown and very little green coloring is visible, although other young plants are much greener. This color is distinct from that of any other Haworthia seen up to this time. Plants of this Haworthia have been observed growing elsewhere under glass, which had a very pale color, somewhat whitish-green.

NOTICE TO AFFILIATES

There are now two sets of 100-35-mm colored slides each available to affiliates. The first set is composed of California Cacti and the second of Baja, South America and Mexican plants. Any affiliate interested in borrowing either set may do so by sending me a \$5.00 deposit.

MARY GLADE, Corresponding Sec'y.
 7600 Verdugo Crestline Dr.
 Tujunga, California.

CACTUS AND SUCCULENT SOCIETY OF AMERICA Officers for 1953

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S. W. McNamara, 1st Ave., Sandgate, Brisbane, Queens, Australia, would like to correspond with other Society members.

WATER BALANCE IN SOILS

Dear Dr. Blanchard:

In your article on Water Balance (January, 1950) you stated that, "some soils though flooded, may still present a dearth of available water. Such conditions are present in salt marshes where the water contains large amounts of dissolved salts. From a physiological point of view, this simulates arid conditions, and only certain plants known as halophytes, that have adapted themselves in a similar manner to xerophytes, can survive." Surely this is simply a re-statement of Schimper's idea of 'physiological drought' (1898) which is no longer accepted by Botanists. Admittedly Schimper went farther and classified halophytes as xerophytes, but the basic idea (i.e. Schimper's reason for so doing) is they are just the same: that the water present is not readily available to plants on account of the high O.P. of the salt solutions.

This in point of fact is not true since the plants growing in these regions (salt marshes, sea-shores, etc.) are quite readily able to adjust the concentration of salts in their tissues so as to develop a suction pressure. It was demonstrated many years ago by Delf (et al.) that the O.P. of the cell sap could be altered by carefully adjusting the concentration of salts in the water in which the plants were growing. Many mesophytes have also been found to possess this property. The plant, then, is able to absorb ions of the salts from the ground water and thus increase the O.P. of the cell sap in the roots above that of the surrounding aqueous medium, and so develop suction pressure.

It is a fact that succulence will support a water-loss high in proportion to the surface area exposed, and this of course holds true both for halophytes and succulents of arid regions. But it does not follow that these two types of plant are anything more than merely *morphologically* similar.

Consider the other xeromorphic characters assumed by many halophytes: sunken stomata, glossy surface, thick cuticle and diminished leaf area. It has been shown that even in xerophytes these play but a very small part in the physiological scheme of things and then only at wilting. Halophytes are able to grow quite well under mesophytic conditions and the normally high O.P. is lowered accordingly, but they very soon wilt and die if exposed to conditions of drought which a cactus or other succulent plant would certainly find no hardship whatsoever. Furthermore it is obvious that halophytes *could not exist* under conditions of drought—physical or otherwise.

DONALD W. BRETT, London, England.

Dear Mr. Brett:

The portion of my article you quoted merely states that in salt marshes only certain types of plants known as halophytes survive because they have adapted themselves in a manner *similar* to xerophytes.

I still maintain this is true and is the result of adaptations, structurally and chemically. The halophyte does not suffer from physiological drought because such a condition does not exist due to its special mechanisms whereby it maintains a perfect water balance in a xerophytic environment. A mesophyte will not thrive in a similar condition because it lacks the mechanisms and immunities essential for such an altered life. It is true that mesophytes adjust the concentrations of the sap of their tissues to develop suction pressure but this adjustment can only take place within their physiological ranges. The osmotic pressure varies with the altered concentrations of soil solutions because of absorptions, leaching, chemical reactions, etc. When the soil solution becomes con-

centrated it soon reaches a level where it becomes toxic to mesophytes. This is the reason why basal plantings at homes with overhanging eaves frequently show progressive deterioration. The soil close to such a building is not sufficiently leached by rains, and mesophytes in time cease to thrive due to progressive increase of the soluble salts in the soil. A frequent error is to apply fertilizers which further aggravate such a condition. Copious leaching will correct this situation.

Mesophytes will not thrive, and frequently perish when the soluble salts in the soil solution show higher concentrations. This is always a problem in greenhouses. Last July (1949) a bench of soil in one of our greenhouses that was in perfect balance structurally and chemically, was steam sterilized. Because it was late in the season, rooted chrysanthemum cuttings were planted without our usual leaching. Within a few days these plants turned brown and later developed necrotic tops. The foliage presented white salty incrustations along the veins.

The sterilization of the soil without subsequent leaching increased the soluble salts to such an extent that it was definitely toxic to mesophytes. Tests for toxic materials as nitrates or excessive ammonia, etc., were negative. The K value of the Solu-Bridge conductivity test showed the specific conductance of the soil solution to be $108 \text{ micromhos} \times 10^{-15}$ at 25° C . When the specific conductance is near 100 we have toxic levels. Leaching of the soil, and shading to reduce transpiration, corrected this condition, and replaced rooted cuttings grew normally.

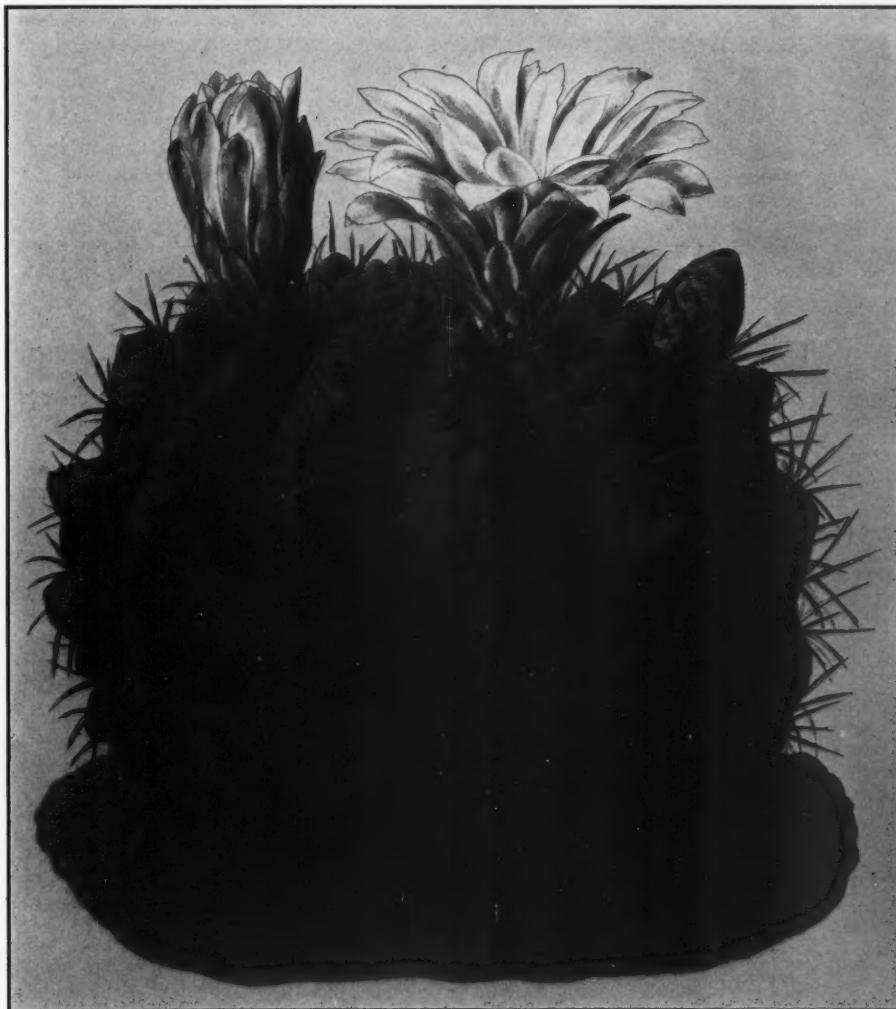
In my article I stated that various mechanisms are involved in water retention by halophytes and that these adaptations are *similar* to those of xerophytes but did not imply that such plants are phylogenetically related. Vegetative similarity is purely an environmental relation.

I do not believe that xeromorphic anatomical structures "play but a very small part in the physiological scheme of things and then only on wilting." The wilting of a plant represents a precarious condition. In mesophytes, if water is not supplied at this critical moisture point, permanent wilting occurs, unless the plant is forced into a resting stage. This does not apply to desert plants or halophytes. On the Florida beaches I observe branches of evergreen halophytes cast up on the hot dry sands where they have been lying for days without the slightest sign of wilting.

Ecological anatomical structures represent adaptations to xerophytic conditions. They are ever present in plants resistant to drought. The development through long periods of such structural adjustments as shown by dense pubescence, thick leathery leaves, needle-like foliage (Pines), marked lignification and cutinization, sunken stomata and many other changes convinces me that it is because of these qualifications, that xerophytic plants thrive in perfect balance and economy and are able to endure drought as described in my article on Water Balance. I do not believe that a mesophyte that has had the osmotic pressure of its sap experimentally altered, would long survive in natural growth without the supporting mechanisms characteristic of xerophytes.

It is obvious that a plant that thrives in any particular environment does so because it has adapted itself to the existing conditions. These adjustments may be physical, anatomical and physiological in nature, but operate in such a manner that the plant lives in perfect balance.

DR. LOUIS E. BLANCHARD.



Echinocactus multiflorus Hook.

Plate 30

From Blühende Kakteen—November 14, 1902.

Echinocactus minusculus Web.

Plate 31

Echinocactus minusculus Weber in Bois, Dictionnaire d'horticulture, 471; K. Sch., Gesamtbeschreibung, 396.

Echinopsis minuscula Weber, l.c.

Rebutia minuscula K. Sch. in Monatsschr. für Kakteenk. V, 102.

This marvelous and dainty *Echinocactus* has quickly endeared itself to all cactophiles, not only because of its unique, blue-green, symmetrical stems, the copious production of offsets which encourage endless propagation, its happy thriving under the poorest of conditions, but above all through the abundance and magnificence of its beautifully-formed and charmingly-colored flowers. When it develops its striking wreath of red flowers at the base of the stem it resembles a brilliant jewel and the eyes never tire of observing and lingering over this fine display.

And this elegant little fellow seems destined to cause me much inconvenience. Upon the establishment of the genus *Rebutia* my adversaries began an energetic attempt to remove me from the German Cactus Society. After I perceived my error I voluntarily and at once admitted I had been wrong; the characteristic on which I had founded the genus proved insufficient to separate the species from its comrades in the sub-genus *Notocactus*. It had already been the cause of an earlier error in which it was considered a member of the genus *Echinopsis*. How often an error furnishes inspiration for renewed and more thorough effort in our attempt to discover Truth!

Today we know its place well enough—it belongs in the sub-genus *Notocactus*, and especially in that group whose members display separated tubercles in place of definite ribs. I have already pointed out that in this process the straight vertical rows disappear and develop into spirals, showing most plainly in the appearance of conspicuous oblique lines on the stem.

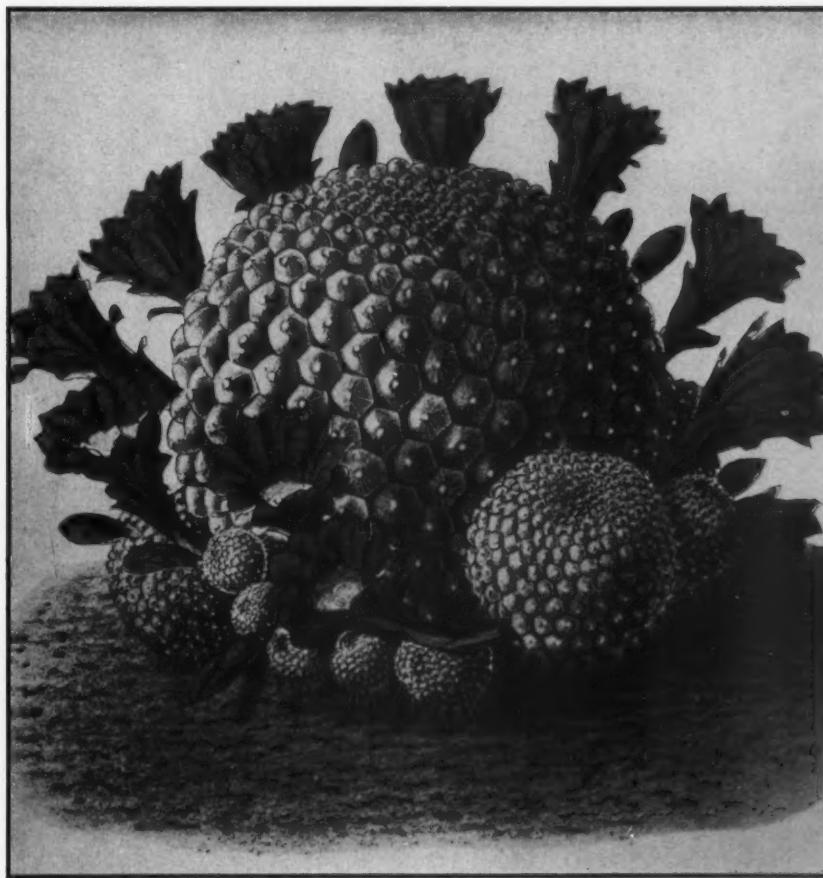
The whole sub-genus *Notocactus* is a well-characterized group from which, after recent knowledge, at least *E. oculatus* Phil. must be removed, and which converges into the sub-genus *Hylocactus*. As to the relationship of *E. humilis* Phil., nothing can be said at present—it unfortunately belongs to those few Chilean species which we have not as yet had the opportunity to examine. It still remains uncertain whether one or the other of these Chileans would be better excluded from the circle. However this may be, it is obvious that *Echinocactus minusculus* occupies quite an isolated position in the sub-genus, as all other species have a fruit adorned with bristles and hair, both lacking in this species. Also the appearance of the flower so far from the crown and at the base of the plant so that it emerges near, or sometimes even from, the ground, is a special characteristic of the species; perhaps this is the cause of its having been transferred to *Echinopsis*, to which in my estimation it cannot belong even if forms like *Echinopsis cinnabarina* are considered. We are convinced that *E. minusculus*, while it is best assigned to *Notocactus*, can still claim a special niche.

The globular berry, as large as a small pea, is red, although it becomes paler on ripening. The minute seeds are black, belonging to the smallest known, and slightly larger than those of *Echinocactus turbiniformis*.

CLASSIFICATION—1950

Notes by W. TAYLOR MARSHALL

Rebutia minuscula (Web.) Schum.



Echinocactus minusculus Web.

Plate 31

From Blühende Kakteen—November 14, 1902.

Mamillaria centricirrha Lem.*Plate 32*

Mamillaria centricirrha Lem., Gen. nov., 42; K. Sch., Gesamtbeschreibung, 579.

While the systematics of many genera of cacti furnish great difficulties, partly due, as in *Cereus*, *Pilocereus*, etc., to insufficient material, so inversely there are those species grouped about *Mamillaria centricirrha* which cause comparable difficulties because of the enormous abundance of material. Here we find ourselves in a most delicate situation, for I am one of those who agree that the group of forms we consider as "Centricirrha's" and which we already look upon with weary eyes, must someday be thoroughly revised once more. Of course this undertaking can scarcely be accomplished in our collections, but rather at the spot where the plant dwells, in order to understand the limits of this species—or the species that are concealed in it; for it is easily possible here that we can separate a number of monotypic species (microspecies), or it may be that only a single species exists which, through its unstable forms, numerous varieties, transitions and hybrids, gives rise to the unending diversity that first provokes our astonishment and finally becomes annoying. In the Royal Botanic Garden of Berlin we cultivate a very large number of specimens which after long consideration, thought and research I still include under *M. centricirrha*.

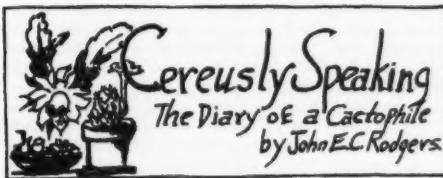
How often I have been confronted with these plants, both during and after work on my Gesamtbeschreibung; how many descriptions I have drawn up, discarded, re-established, in an attempt to bring order to this endless multitude of objects, of which one can only say: they seem to differ! All were nicely separated and clarified, but if it was desired to express in print any clear-cut limits the whole structure disintegrated and species were impossible to segregate. Perhaps we can do no better for the present than to conceive of *Mamillaria centricirrha* as having the largest possible content; it seems to me that in properly interpreting this plant no attempt should be made to resurrect species from all, or even part, of the more than 50 synonyms I enumerated in the Gesamtbeschreibung, in the danger that one or two genuine species would undeservedly fall into oblivion. As to this last point, I have decided of late that because I have kept apart some of the related species there would be as much justification for again making independent several forms that have been considered as being under *M. centricirrha*.

At present the cactus growers' interest in the Centricirrha's has waned, one result of this being that no longer do "new species" appear as often in trade catalogs. One no longer buys them and because of this the incentive to offer new species is diminished. They shall always retain their value, however, as no one can deny that the early development of the daintily-formed and finely-colored flowers makes them commendable plants, and when each forms its full crown of handsome carmine-red blooms they can only be looked upon with delight. Moreover, when carefully cultivated they grow into conspicuous and stately plants, well worthy of the space they occupy. A too rich culture does them no good, as I have repeatedly seen plants, too luxuriantly developed, that split easily at the crown and became deeply cleft—the releasing of a quite unique tension I have not seen in any other stem-forming plant which grows above ground.

**CLASSIFICATION—1950**

Notes by W. TAYLOR MARSHALL

Mammillaria magnimamma Haworth.



To keep a cactus diary for 19 years has not been easy but as I enter the year 1953, and see the wealth of information I have accumulated, varified and ready for use I feel it was well worth the time it has consumed. I buy a five year type which usually contains 4 or 5 lines these I write on and between so I have from 7 to 9 lines a day to fill. I have the year, day of week, weather station reports, sunrise and sunset, state of weather and pertinent information about plants (buds, new growth, first flower, watering, placement this and previous years, etc.). The diary I am finishing this year began January 1, 1949, and will be completed December 31, 1953. In the back of the book are usually memorandum pages—these I divide up into space for the name of the plant and five spaces for the 5 years covered by the diary. Here the date of the first bloom for the year is placed so that I can look back at the date and compare what new factor or set of factors has worked for me or against me.

It is always a source of satisfaction to find that during the winter year after year a score or more of cacti and other succulents—bud, bloom, rest and start growth within a set period almost as if a time-clock regulator governed them. I've checked the growing conditions which cause this phenomenon for this very small percentage of my collection. Succulents and cacti alike gladden my collectors eye. I have a few "semi-succulents" that bloom consistently also—such as *Rhoeo discolor* (Moses in the cradle), *Peperomia obtusifolia* (also variegated form), *Peperomia sandersii* (watermelon begonia), *Veltheimia veridifolia*, etc.

The winter season with these cacti and other succulents can be one of constant wonder starting with the "Christmas cactus" then the *Rhipsalis*, *Lepismium*, *Epiphyllanthus*, *Pseudorhipsalis*, etc. These winter blooming species all require year around care to get the best results. The "Christmas cactus" which is considered a hybrid between *Schlumbergera russelliana* and *Zygocactus truncatus* (Thanksgiving cactus) is without question the best known cactus, and from my mail and that of others, first of the "worry clinic"—"as to why this plant or that plant doesn't bloom." It does not like low temperatures (when growing) nor aridity at the roots or about stems. It can stand coolness (42°-55°) while setting buds but dry air and heat makes it lose its buds. It thrives best for me suspended among my other Epiphytes in "light" shade, where the air circulates freely, light is not too intense and moisture is plentiful. A dry-spell from late August or early September ripens the new growth. The buds appear at the ends of the mature stems only. A sprinkling over the top and a top dressing of some good fertilizer lightly stirred in the soil with a good soaking once a week (on bright days) does wonders to keep the buds on into flowers.

My *Rhipsalis* bloom while quite small. They like a well shaded airy position along with the other Epiphytes. They grow rapidly with plenty of water, good drainage and an all around fertilizer (if not repotted regularly). During the winter I keep them suspended in full light (average 22 days of sunshine over 5 year period for December through March). Since Epiphytes usually grow high up in trees in

pockets of leaf mold. I keep mine hanging from the bars as this approximates natural conditions of good air circulation, warmth and humidity. Here I obtain my best results of buds, flowers and early spring growth.

I keep my *Phyllocactus* stored during the winter months on shelves open on both sides near the greenhouse roof. The shelves are the widened windowsills of two windows that let in light and air to the storage room from the greenhouse. With this kind of care the buds begin to appear late in December and January. The dual nature of the McDougall hybrid, *Epiphyllum Ackermannii* × *Pseudorhipsalis macrantha* is shown as it buds in October and blooms in January. Perfumed orangey-rayed-flowers up to three and one-half inches across. Midway between *P. macrantha* and *E. Ackermannii* bloom times.

So far one of the best drained soils for Epiphytes I have found is granulated maple leaf mold which is the "grainy-by-product left from old-leaf-pile decay. It retains moisture but the excess drains off without leaving the soil spaces filled with water which shuts out air circulation about the roots that all Epiphytes need. It is also a good soil for terrestrial orchids, *Aechmea*, *Billbergia* and *Cryptanthus*.

I treat the orchids and Bromeliads with the same zoning as my other Epiphytes. Outside of the orchids which are still small but grow well, the Bromeliads bloom. *Billbergia nutans* is another Christmas flower—apple green, blue and pinks, is always welcome at Christmas and if kept cool the period of bloom lasts about a month.

My cool greenhouse of last winter, 1951-1952, produced such good firm growth, profuse blooms and other advantages that I've decided to keep the night temperature between 45° and 50°. I attempt to keep the glass free of grime on the inside but the sulphurous acid from moisture and sulphur in smoke cause the glass to become "iridescent" on the outside. Makes the reflection greater and cuts down on the light. The glass of "ancient" lineage in some of the older lights of greenhouses turn purple much as old glass does in the desert when traces of manganese are present. A great deal of the spring growth and bloom depends upon the intensity of the light. It is always wise in one's diary to keep the best location and results recorded. Some plants bloom toward spring on the part away from the strong light even when the plant has been turned with its last year's blooming side towards the light (even the third year seemed to prove this). Others such as the *Mammillarias* bloom around the top where the light is best. *Rebutias* near the base seem to enjoy some shade so the buds appear around the bases. Most of my hybrid Epiphyllums bud where the light is not too intense. I've studied pictures of plants in nature and greenhouse where the direction of light could be seen. The plants do seem to avoid the strong light of spring whether in the south temperate or north temperate zones. The tendency is called "phototonus." More observation of cacti and other succulents should be made and studied.

Starting last August and extending into this new year of 1953 I've fought and intend to fight my "humanitarian" impulse towards all plants other than Epiphytes. Withold water, lower temperature, topsprinkling when sun is going to shine and keep to it. They do seem to be resting at the present time but I can't stay out in my greenhouse the long periods of time I used to, because I'd be lenient again, so I pop in and out during the week and do my plant work on Saturday. If the globular types from mountains, deserts and plains can stand dryness, coolness and light then they should do so in my greenhouse, storage etc.

Crassula Schmidii (*C. impressa*) with reddish leaves in the sun and cerise to red flowers has been in bloom since before Christmas and will continue to bloom well into February. It grows well and also blooms in the window garden. A hanging variety of *Crassula* with white flowers (*C. breviflora*) has trailing reddish green stems and leaves, which sets off the whiteness of its flowers. Another *Crassula multicauda* with apple blossom-pink trusses of flowers is also in bloom. A more beautiful trio for the winter season would be hard to find. The *Crassulaceae* are of easy culture and propagation. They also grow well among the Epiphytes.

The Aloes like the cooler part of the greenhouse where the temperature stays steady. *A. variegata*, *longistyla*, *minima*, *brevifolia*, *ausana* and *cilaris* pro-

duce blooms freely during the winter months. The Aloes make a good foil for the pink spikes (red-hot-poker bloom types) of *Vetiveria viridifolia* (Rex Pierce catalogue page 2). The white and pink blooms of *Pelargonium echinatum* appear at this season as well as the *Echeveria glauca*, *metallica*, *linguifolia*, *polvinata*, *macrocalyx*, *gibbiflora*, and their hybrids and add exotic color and pattern to the north side of my greenhouse. Coolness only makes the leaves and stems more brilliant in color to add to the yellows, pinks, reds and combinations of the blooms.

One plant I do not see mentioned as having interesting blooms with a definite perfume is *Crassula "pyramidalis"* (so labelled when I bought it but resembles a larger *C. pseudolycopodioides*). It blooms

Continued on page 28

MINIATURE GREENHOUSE

Specification and Description of a Miniature Greenhouse for Cacti and other Succulent Plants, by John M. Denny,
14 St. George's Avenue, Weymouth, Dorset, England.

GENERALLY:

The drawing illustrates a miniature greenhouse which I made three years ago for my potted cactus plants, and which I have found to be very satisfactory in the English climate. The sizes shown on the drawing need not be followed exactly; the size of the Greenhouse is limited only by the sizes in which the component materials are made.

The advantages of the design are as follows:

(1) It provides sufficient protection against frost to enable the greenhouse to remain in the open air from the beginning of April until the end of October, and it may be placed in a position to receive the maximum number of hours of sunshine.

(2) The plants are completely protected from the rain and receive ample ventilation without draught.

(3) The plants are protected from slugs, snails and their other enemies except ants.

(4) The pots may be watered without the necessity of removing the cover.

(5) The covering material is claimed to admit the ultra-violet rays which glass excludes.

(6) The covering material affords the partial shade in which most cacti flourish.

The covering material is marketed in England as "Windowlite"; this (or a similar product) is almost certainly available in the U.S.A. It consists of a fine wire gauze covered with a transparent plastic substance. This material should not be regarded as permanent in the open air, but it is easily replaced. My own greenhouse has been out of doors for three summers without showing any signs of deterioration.

CONSTRUCTION:

The greenhouse consists of two parts:

(1) A shallow tray on which the pots stand.

(2) A movable transparent cover.

The Tray. Overall dimensions 1' 6" x 1' 1". This is built up on 2" x 1/2" framing with square pieces of oak (to resist rot) at each corner to raise it clear of the ground. The bottom of the tray is made of 3/8" wood (a common thickness in packing crates) or else asbestos-cement sheeting. The sides of the tray are of 2 1/4" x 3/8" wood and the whole tray is lined with a good quality of tarred roofing felt. The inside of the tray is painted with bitumen and the tarred felt may

be worked into position with a hot smoothing iron, and then tacked around the top and trimmed.

At either end of the tray is fitted a piece of 1/2" diameter brass tubing,—this may be screwed into the wood if the outside is threaded. One tube is fitted with a bottle cork; the other is fitted with an elbow bend and a small funnel soldered on,—I used part of an old oil-can. The entrance through the funnel should be covered with perforated zinc to exclude insects, and the top of the funnel must not be higher than the sides of the tray. The tray should be painted or creosoted and the inside sprinkled with sand.

Cover. The cover consists of a wooden frame of 2 1/4" x 3/8" wood with an inside dimension of 1' 6 1/4" x 1' 1 1/4"—or 1/4" longer than the tray in both dimensions. Inside is a 3/4" x 3/8" fillet as shown on the drawing.

At either end of the cover a steel lath 1" wide, is drilled, at about 3 1/4" centers, carefully arched, and screwed to the frame,—for this I used the steel laths from an old air-raid bunk. Around the frame was screwed blocks of wood 3/4" x 1/4" as shown on the drawing; the spaces between those blocks form the air-inlets. The four corner blocks are splayed as shown. The wood and steel should now be painted.

The covering material is then cut to the required sizes. The pieces for the end should be cut around a template made of stout paste-board,—remember to allow 1" extra width for the bending back over the steel laths. The plastic covering is removed to form the air-inlets and the circular extracts. This may be burnt off with a lighted taper; cut a round hole 2" diameter in paste-board and burn through this. The exposed wire must be painted to prevent rusting. The ends are put into position as indicated on the full-size detail, the serrated edges being dressed over the steel laths and the bottom edges bent under and tacked to the frame. The double thickness is secured to the 3/4" x 1/4" blocks by means of 1" wood screws with washers. The bottom edge is bent slightly outwards to let the rain water drip clean of the frame. It will be seen that the wire gauze from which the plastic covering has been removed covers the air-inlets and prevents the entrance of insects, etc.

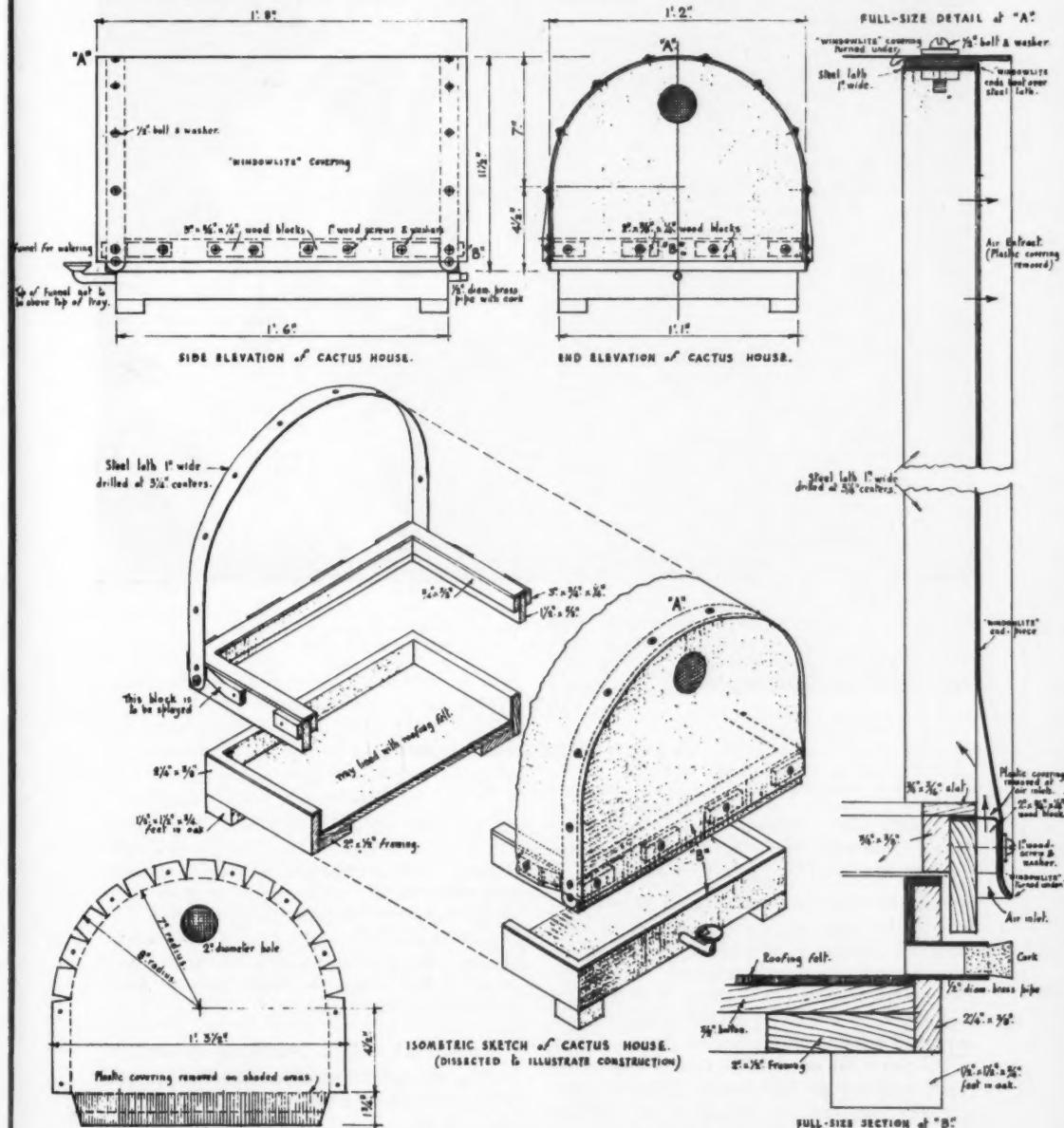
The principal piece of "Windowlite" is then cut 4" longer than the overall length over the steel laths, the plastic removed from the edges which again folded under as shown on the full size detail. Start by fixing

at the top and work downwards when fixing. Keep the "Windowlite" taut while it is being punched and bolted to the steel laths with $\frac{1}{2}$ " bolts, nuts, and washers.

Finally tack a $\frac{3}{4}$ " x $\frac{3}{16}$ " lath (mitred at the corners) around the top of the wood frame to cover the rough edges of the "Windowlite."

TO WATER THE PLANTS:

See that the cork is in position and then pour water in through the funnel until the latter overflows. The tray is made shallow so that the water cannot rise more than $1\frac{1}{4}$ " up the posts. After about 2 minutes remove the cork, allow the water to drain away, and then replace the cork.



DESIGN for MINIATURE GREEN-HOUSE for CACTI

SCALES : FULL-SIZE & QUARTER-INCH TO ONE FOOT.

JOHN M. DENNIS, A.R.I.B.A : CHARTERED ARCHITECT,
WALFORTH - ENGLAND - JULY 1948.

FIG. 12



FIG. 13
 LEFT: 21a. *Sedeveria x Hummellii*, flowering plant, app. x 0.25
 RIGHT: 21b. *Sedeveria x Hummellii*, foliage, app. x 0.35

SEDEVERIA A New Bigeneric Hybrid

By ERIC WALTHER

"SEDEVERIA; hybridae inter *Echeveriam* et *Sedum*, characteribus intermediis sunt." Genotype: *Sedeveria x Hummellii* E. Walther.

The new name here submitted is made necessary by the recent raising of a number of such bigeneric crosses, of which one is further described and illustrated herewith. *Echeveria Derenbergii* has been used as one parent, while of the several species of *Sedum* involved most appear to belong into our Section *Bergerosedum* of the genus *Sedum*, by Berger and others variously assigned to *Pachysedum*, *Dendrosedum*, etc. *Bergerosedum* as defined by us contains several Mexican species of *Sedum* characterised by their shrubby habit, scattered or subrosulate leaves and a lateral, axillary inflorescence. In the possession of this last character, these *Sedum*-species agree with *Echeveria*, from which fact we

may speculate as to the derivation of *Echeveria* from this portion of the immense genus *Sedum*. More detailed information on the chromosome constitution of the group would be most interesting, and may be forthcoming shortly. The several hybrids are usually clearly intermediate between the respective parents, even if the characters of the obviously more ancient genus *Sedum* appear to be dominant.

21. SEDEVERIA x Hummellii sp. nov.

"Hybridae inter *Echeveriam Derenbergii* J. A. Purpus et *Sedum pachyphyllum* Rose sunt."

Description: Subshrub, to 10 cm. tall, branching from base and above; leaves numerous, spirally scattered, scarcely rosulate, obovate-oblong, cuneate, at apex obtusish to acute, thick, to 35 mm. long, color biscay-green, at apex indian-

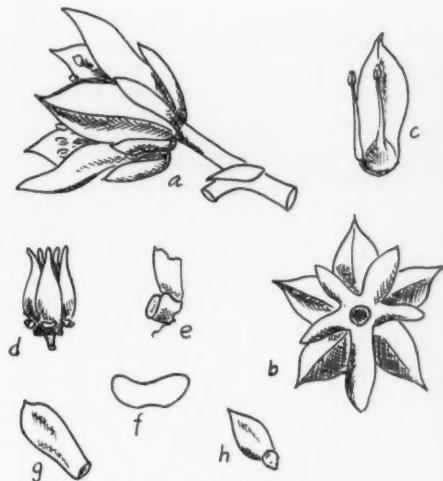


FIG. 14

Sedeveria x Hummellii.

- a. Corolla, sideview, app. x 2.
- b. Basal view of calyx, app. x 2.
- c. Inner view of petal, app. x 2.
- d. Carpels, app. x 2.
- e. Nectary, app. x 8.
- f. Nectary, app. x 8.
- g. Leaf, app. 0.4
- h. Bract, app. 0.4

red to vinaceous-russet; inflorescences several, always lateral and axillary; peduncle to 12 cm. long, slender, orange-cinnamon, bracts few, to 15 mm. long, ovate-elliptic, acute, courge-green to light-grape-green; branches two to three, secund, each with 5 or more flowers; pedicels to 7 mm. long; sepals unequal, subterete, obtuse, appressed, colored as bracts; petals ascending, somewhat spreading above, keeled, acute, 10 mm. long, basal hollow shallow, color empire-yellow, slightly darker on keel; carpels 6 mm. long, citron-green; nectaries reniform, 1 1/2 mm. wide, chartreuse-yellow. Flowers March.

Remarks: We take pleasure in dedicating this hybrid to E. C. Hummel of Inglewood, California, in recognition of his enterprise in the making of these various experimental crosses. The affinity of the present hybrid with *Sedum pachyphyllum* is evident, and it might be described as a larger version of that plant. The influence of *Echeveria Derenbergii* is less obvious, but may be seen in the larger, subangular leaves, the larger, more open flower-clusters, the larger flowers with petals thicker, darker and more prominently keeled.

Type: Herbarium, California Academy of Science, Golden Gate Park, San Francisco; grown at Strybing Arboretum and Botanic Garden.



FIG. 15. *Fockea* sp. from Southern Rhodesia. It is a large succulent, strangling vine. Those farther towards the Cape—of which there are several near *F. capensis*—have very large succulent roots up to 10 feet in diameter which, after the infrequent rains, throw up succulent, climbing stems which sprawl over adjacent trees or bush.

Chicago Cactus Society Officers

President, Mrs. Lyman Wilkenson

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LECTURE

Dr. Robert Talisman of Long Island gave a talk before the Horticultural Society of New York "Cactus and Succulents for the Easterner." It was illustrated by both plants and color slides accompanied with a discussion of propagating methods. We hope that Dr. Talisman will summarize this talk for the CACTUS JOURNAL.

In 1950 South African exports of wool topped that of gold in value. That means the continual increase of sheep herding will the more quickly exterminate many of the succulents with localized ranges. Many fine kinds occur in very limited areas.

BEGINNER'S LUCK IN LOUISIANA

By EVELYN F. BARNETT

If you have tried the average things that keep people occupied in their spare time and found them wanting, if you're bored with yourself and at a loss as to what to do about it and if you feel that you need some *real* occupational therapy, start growing cacti. To me it's the answer to all those problems, a sort of psychological Cracker-jack—the more you get, the more you want! And never a dull moment.

Slightly over a year ago a neighbor brought me a catalogue from Johnson's Cactus Gardens to disprove an idea that all cacti had flat pads and wicked spines; spines that delighted in fastening themselves to the skin and clothing of the unsuspecting. I looked, I saw, and was conquered! I sent for my first order and have been ordering ever since. I have over four hundred of these fascinating plants and expect to have at least four hundred more by this time next year. They have crowded us out of porches, have assumed control of every available window in the house (which fortunately is large and has lots of windows), and have now demanded a greenhouse to themselves, which request is being granted as speedily as possible. They have promised to bloom more profusely and regularly when they have a home of their own.

Visitors shake their heads and direly predict that "cacti just don't do well in this damp climate—you'll never raise them." But the plants and I know better; they seem to like it here and most are doing very well. Of course there are problems, but I have never thought they were insurmountable.

We are fortunate in having a rich sandy loam on our place, a soil that causes such mundane plants as "Prince's feathers" to grow to a height of ten and twelve feet instead of the average 3 feet mentioned on the seed packages. Banana plants put out in early summer of last year are 18 feet tall and producing bananas and a *Bryophyllum daigremontianum* has grown in one summer to a height of six feet. I mention this to show that this loam, especially when mixed with equal parts of good rotted leafmold and coarse sand, seems to be doing wonders for the cacti too.

With the exception of some wild collected Mexican plants imported last spring all species of cacti are planted in the above mixture with a little granulated charcoal added. You can almost see them growing! The little wild Mexicans seem to like a mixture of pure sand and leafmold with a little charcoal. I was surprised to see

Ariocarpus scapharostrus and *Turbinocarpus* (*Ariocarpus?*) *Klinkerianus* in full bloom one morning recently.

Last winter most of the plants were housed on racks of shelves built across two picture windows in the dining room which has western and (unfortunately) northern exposure. We were obliged to keep the room warmer than the average resting temperature and of course I had to water oftener—about once a week. Only one plant, *Peruvocereus viridiflorus*, objected to this and showed its displeasure by rotting off. The rest did well, including four varieties of *Stapeliae*, two of which bloomed last summer. (*gigantea* and *variegata*). In spite of the fact that the plants did not get the really dry rest they should have had a few bloomed last spring—*mamillariae*, *rebutiae* and *echinocerei*. Obviously they would have behaved in a nicer manner had they been allowed their full beauty sleep. They will get it this winter, I hope, if the greenhouse is ready.

Epiphyllums, of which I have just eight plants, were only rooted cuttings when I received them last spring. They are planted in tin syrup cans (half gallon and gallon sizes) in a soil mixture of three parts leafmold, two parts sandy loam, 1 part sand and a little charcoal. They love it—at least, they have shown their pleasure by growing like weeds and promising to bloom next year. The cans are not the answer to a decorator's dream but they retain moisture much longer than clay pots and cut down danger of overwatering. I find that in very hot weather it is necessary to water these plants only about three times a week; they just reach the barely damp stage when its time to water again. They are fed once a month with an organic base fertilizer and respond nicely. So far there have been no casualties in the epiphyllum family.

I am also trying my luck with many of the other succulents, including Haworthias, Adromischus, Euphorbias, Aloes and various Mesembs. *Euphorbia obesa* and *E. tubiglans* both bloomed (such tiny flowers!) and *Conophytum Braunsii*, *C. griffithianum*, *Ophthalmophyllum Schlechteri*, *O. Triebneri* and *O. Frederickii* all bloomed in early November. It is a real thrill to see these tiny growths bear their pretty daisy-like flowers.

Now we will leave the house and walk out to the "experiment station," which is an outdoor cactus bed on the south side of the house, open on all sides but having a roof made of bamboo

poles laid across pipe supports and lightly covered with Spanish moss to furnish some shade from the hot sun. I call this the "experiment station" advisedly because that's just what it is. No attempt has been made to create a real desert garden, mostly because you can't get rocks of any kind down here and I feel that concrete or synthetic stone would be out of place. The cacti, although planted without any special aim at a decorative effect, look very charming and entirely incongruous against the rest of the landscape. This outdoor planting is the real test as to what species do well in this climate. During the summer, particularly in July, we have excessive rainfall and during the winter we have some rain coupled with temperatures that sometimes are mean enough to register 20 degrees. The average winter temperature, however, is between 38 and 40 degrees. So far the results indicate that the South Americans such as *Trichocerei*, *Cereus peruvianus*, *C. hexagonus*, *Harrisia Martinii*, *Cleistocacti*, *Gymnocalycium*, *Noto-cacti* and *Echinopsis* do best. The Southwesterns that can stand cold can't seem to survive the moisture, although the soil is very well drained with underground piping and plenty of gravel beneath the soil mixture. After losing a mature *Thelocactus bicolor* and a particularly lovely *Echinomastus* during the July deluge I took up all the rest of the Southwesterns and called it a day as far as their outdoor planting was concerned. They are mostly older plants and are enjoying the brisk Fall weather on an open porch with Southern exposure. They will probably stay there most of the winter unless we have really bad weather.

Harrisia Martinii and *Acanthocereus* (unidentified) put forth beautiful nocturnal blooms, while reliable little *Gymnocalycium Mihanovichii* bloomed profusely from April until about the middle of October. The other "experiment station" tenants are too young to bloom as yet.

When I'm not hovering over the plants themselves I'm reading about them. The "whodunit" that formerly absorbed most of my reading time has given way to the book that dispenses knowledge about cacti and succulents. After all, Perry Mason is a smart fellow but he doesn't seem to know much about cacti and Nero Wolfe spends all his leisure time between homicides in his orchid rooms.

Summing it all up, I think that the two most important things for real beginners to know about their hobby are (1) Frequency of watering, summer and winter. I water once a week indoors in summer except for succulents which seem to like more moisture—I water those when

they're dry; and twice a week for plants outdoors on porches. The very small seedlings in two-inch pots get water twice a week indoors and on alternate days outdoors. They may stay a bit dry but they don't rot off and eventually they do grow into larger plants! In winter it's a matter of less water, but how much less depends largely on room temperature and age of the plant. The watering problem seems acute at first, but after you grope about a while you get the "feel" of it and most of the doubts disappear. I have visited collectors in this general area who have large collections housed under glass and they have confided that their losses are discouraging. Upon inquiry it usually appears that their plants are being consistently over-watered; in fact, one collector informed me proudly that his plants were watered "every day, regardless." The losses thus explain themselves. The plants which manage to survive this treatment are large old specimens with established root systems—like old campaigners, they seem to be able to take it. (2) Observation of the resting period. This is important to we beginners who hope for success not only with cacti but with the African succulents, especially the temperamental little Mesembs. I lost two *Pleiospilos Nelli* before it dawned on me that I was watering during the resting period. Since reading up on this type of plant my luck has been much better. Most of the Mesembs are responsive and easy to grow if you just let 'em sleep when they want to.

The articles by amateurs appearing from time to time in the Journal have been a source of real inspiration to me, especially those amateurs who have the courage to battle the elements in the frozen North and Northwest and emerge victorious. After reading of the many handicaps under which these courageous collectors operate it seems easy indeed to raise cacti down here under the Louisiana sun, even though the cliche generally used is "It ain't the heat, it's the humidity." Make no mistake about it and don't be discouraged if you're a new collector south of the Mason and Dixon line and east of the Mississippi—you can grow cacti and succulents successfully and have a barrel of fun doing it.

It has taken more courage to write this article than to try arid grow plants. Probably a lot of nerve, too. But we have to make a start and there must be thousands of beginners like me who need just a little nudge of encouragement to keep them going when the going seems toughest. I for one would be happy to see articles from other "greenies" appearing in the Journal—and now that the first crumb has been strewn, let's see how many sparrows will come and nibble at it.



FIG. 16. The Covered Wagon Amphitheatre at Knott's Berry Farm.

CONVENTION FUN SESSION

Our conventions are always happy times from start to finish but the most hilarious times come at the fun session when we crown our new king and queen and initiate the novices into the Ancient Order of Cactus Nuts.

This fun session will come in the middle of our formal convention program. Early in the afternoon of Saturday, July eleventh, we will board our chartered busses at Arcadia for the drive to Knott's Berry Farm at Buena Park. Knott's is a unique California attraction that has grown in a little more than twenty-five years from a primitive roadside stand serving sandwiches and pies beside the berry patch, to a famous place that serves many more than a million chicken dinners every year. No liquor has ever been sold there. Every year new attractions have been added. The latest is an old time narrow gauge railroad with its equipment. The most famous of the attractions is Ghost Town to which many buildings and their furnishings have been moved from old mining camps and the pioneer towns of the West. Near by are the replicas of a gold mine and an active volcano. Next to these is the Covered Wagon Camp consisting of a tree shaded open air stage and an amphitheatre backed by numerous old covered wagons.

On arrival, we will go to the Covered Wagon Camp for the taking of a group photograph. After that will come a tour of Ghost Town with a chance to visit with the poor fellow in the calaboose. He often says things that will surprise you. Then to fortify us for the ordeal of the initiation, we will enjoy one of the famous chicken dinners in one of the dining rooms. After dinner we will all gather in the Covered Wagon Camp for the crowning ceremony and initiation rites. Ladislaus Cutak and Queen Patricia Moorten have

assumed the responsibility for this portion of our program, so we know a good time is assured. Certificates of Initiation will be given to all who attend this ceremony. Attendance at one of these fun sessions is the only way these certificates may be secured.

On Monday, the day after the close of our formal sessions, we will again take to the busses for a trip to Hollywood and Vine Streets, then past one of the palatial homes of famous movie stars to the beach at Santa Monica and then northward along the sea shore of the Malibu colony to Ventura and Santa Barbara. Following lunch in Santa Barbara, we will visit the palatial Lotusland estate of Ganna Walska in Montecito. At Lotusland, this notable lady has built up one of the finest cactus and other succulent collections in existence. On the return to Arcadia we will see oil wells sprouting up out of the ocean and get a glimpse of the San Fernando Valley.

Some time in May, an information sheet with more details of the convention and reservation blanks for registration, lodging, meals and trips, will be mailed to all members of the Society in the United States, Canada and Mexico. Be sure to mark the following dates on your calendar: July 10-12 at Arcadia, July 13 to Santa Barbara, July 14 and 15 on desert trip to Twenty-nine Palms.

HOWARD E. GATES
Convention Chairman
Corona, Calif.

EDITOR'S NOTE: Several members have asked what gardens, en route to California, are open to visitors. If your collection is open to visitors, please write to THE CACTUS JOURNAL, 132, W. Union St., Pasadena California, stating the dates that you will be glad to meet members en route to the Convention.

THE GOLDEN BALL CACTUS

By WM. MASTRANGEL, Rocking Horse Cactus Gardens

The Golden Ball Cactus—*Notocactus Leninghausii* (K. Sch.) Berger, in previous years was called *Echinocactus Leninghausii*. This plant is one of the most beautiful cacti of South America. It hails from Southern Brazil, and always has been a favorite with collectors, not only because of its easy growth, but also for its ease of handling. This beautiful cactus is not to be confused with the golden barrel, a Mexican plant of entirely different growth.

This favorite is recognized by its many narrow ribs—generally about thirty—long soft hair-like golden yellow spines arched downward. The growing center has white wool; the glossy yellow flowers—quite large—are borne at the top of the plant, near the center, and are generally seen on the older stems. In this country, the Golden Ball generally starts to flower when it reaches a height of about four inches, or when the plant begins to sprout pups at the base. These beautiful flowers generally last for several days.

Although this outstanding plant grows very well on its own roots, it is very often grafted. However, regardless of which way it is grown, the rate of growth is always very slow. In this respect it is very similar in growing habits to the Mexican Old Man Cactus (*Ceph. senilis*). Generally, a twelve to fifteen year old specimen will be approximately ten inches in height. Young plants of *N. Schumannianus* (The Giant Ball) are very similar in appearance to the Golden Ball except that the former has stiffer spines and is coarser in appearance.

CULTURE—Since the native habitat of the Golden Ball Cactus is moderately dry hillsides of southern Brazil, it likes a well drained soil of the usual cactus mixture (gravelly sand, top soil and leafmold), with the addition of a trace of lime and some charcoal. Although many Notocacti like full sun, the Golden Ball prefers a little shade—or rather a slight partial shade. Water moderately during the growing season, and very sparingly during the winter dormant period. It is especially essential that you mark the pot of this plant so that one side faces the south during its entire life. This will not only prevent sunburn but will induce the plant to flower regularly when flowering period arrives. This will not affect the beautiful growth of this plant, for the Golden Ball generally grows pretty straight with very few bulges, and slight leaning.

This golden beauty grows well in all parts of the world and collectors have written to us from Canada, Sweden, Italy, etc., of its tractability

and ease of adaptation to any climate—whether damp, dry, cold, hot, and even (apologies to California) in smoggy climates. As a pot plant in the home it is hard to beat, requiring only a place by a well lighted window.



FIG. 17. The Golden Ball Cactus. From "Cactus" van Laren. See illustration of plant in flower on cover.

The Golden Ball is one of our top three favorite plants and it is a beautiful sight indeed to see its brilliant golden spines shining in the sunlight, and when topped by one of its bright yellow flowers, it is really a flame of beauty. This is the kind of cactus that makes cactus collections worth while and stimulates interest in this wonderful hobby.

Next issue—"The Mexican Old Man."

NEW ZEALAND SOCIETY

You may be interested to learn that our own Society is still going ahead. In fact we have quite a nice balance in the banks at this annual report. Now we feel that we are firmly established and so plan to provide more illustrations in our journal. We added an extra 4 pages last year, thereby increasing to our expenses by 50 per cent. Membership is increasing and now there are over 600 on our financial list.

We have 9 branches throughout N. Z. and several others soon to be born. Roughly 40 members in overseas countries.

I know several of our members belong to your society but there would be many more if the dollar trouble was not so grim.

A. B. CUTLER

PROPAGATION FROM LEAVES

Many of our readers will have experienced the delight of watching the pretty little rosette grow at the base of a leaf placed upon the ground and gradually develop into a new plant which can then be passed on with pleasure to another collector.

It may not be known, however, that Nature provides leaves specially adapted to this purpose at a certain time of the year. It is not necessary to denude the main rosette of your plant of leaves for the purpose of leaf-propagation.

Take, for example, the well-known plants, *Echeveria liruenda* with "soft" heavily keeled leaves; *E. carnicolor* with more "solid" reflexed leaves; *E. harmsii* (*Oliverianthus elegans*) of a more bushy type; or *Urbinia purpurea* with very thick leaves.

All such plants send up long flower stalks upon which quite a number of leaves grow. After the flowers have withered off, and before the flower-stalk has become a dried stick, careful observation will show that the stalk-leaves have developed a distinct "heel" on "toe"—there is an air-space to be seen between the old flower-stalk and the base of each leaf. These leaves are slowly but surely detaching themselves from the stalk for propagation purposes.

The least touch or puff of wind at this stage will cause them to fall to the ground.

The use of these flower-stalk-leaves for propagation purposes not only gives more plants and saves waste but is far more satisfactory (when they are available) than taking leaves off the main rosette of your plant. When there is no other choice but to take leaves off the main rosette, the lower leaves should be discarded as quite unsuitable for propagation purposes since they have a thin "paper" base due to the fact that all the lower leaves are in the process of withering away.

Healthy leaves higher up on the plant must be carefully removed, these in turn have more surface area at the base which it is necessary to callous-off in order to avoid rot setting in. Another disadvantage in taking main leaves!

Referring once again to the various types of leaves which we shall place ON the soil; collectors will no doubt have noticed that the more flexible types (such as *E. liruenda*) first turn the base of the leaf AWAY from the soil before fine roots begin to form, in fact they "turn up their toes" before sending out a "beard" of fine roots.

In the case of the more rigid (reflexed) leaves such as those of *E. carnicolor* no such movement takes place. It is wise, therefore, with this type of leaf to make sure that the base of the leaf is in direct contact with the soil (but not beneath) from the start.

It must always be remembered that the tiny rosette (new plant) lives on the parent leaf until such time as it has established its own root system and can obtain nourishment from the soil.—R. Chee.

The Cactus and Succulent Journal of New Zealand

EDITOR'S NOTE: For illustrations, see page 20, "Succulents for the Amateur."

PRESERVATION OF "LIVING MUSEUMS" SOUGHT THROUGH NATURE CONSERVANCY BILL

Seeking to save some of the remaining natural areas as "living museums" of primeval America for the benefit of future generations and for scientific study, Congressman Charles E. Bennett of Florida has just introduced a bill to establish a Nature Conservancy of the United States.

The Nature Conservancy is to be a voluntarily supported nonprofit organization with membership open

to the public. The bill does not provide for any appropriations from the federal government.

The Nature Conservancy is designed to supplement the efforts of the National Park Service and to be an extension of the nature preservation side of the state park programs. The principal job will be to aid in the preservation of small natural areas and to help retain some of the natural features of the landscape for public enjoyment. Local areas of special scientific, educational, and esthetic value will be given most attention.

Typical examples of many kinds of natural features will be sought out and preserved. This will usually be done cooperatively with county or state governmental agencies or with local conservation organizations, schools, or museums. The organization also will give technical advice to landowners interested in nature preservation.

The setup of the proposed Nature Conservancy follows the pattern of a number of other organizations. The Ecologists Union, a national society founded by scientists, has been working on natural area preservation problems. It is one of the groups supporting the movement to establish the Nature Conservancy. The bill is similar to the Act which established the new National Trust for Historic Preservation in the United States. The latter, in turn, was copied from the Massachusetts Trustees of Public Reservations and the British National Trust, both of which are more than fifty years old. The International Union for the Protection of Nature, an organization that has developed under the sponsorship of UNESCO, is undertaking a nature preservation program on a world-wide scale. England has just recently formed a Nature Conservancy with much the same objectives as those proposed in the U. S. bill.

Scientists say that many of our natural features are already becoming rare and that we must save samples of them in the immediate future if we are not to lose them entirely in the onrush of civilization. The various kinds of prairie and grassland are reported to be among the least well represented by preserves, but there is equal need for saving examples of many of the desert, forest, and marsh types. Examples of geological formations such as caves and unusual rock outcrops will also be preserved under the program.

According to the Ecologists Union, these samples of wild nature are extremely valuable for scientific research. Biologists and land managers use them as experimental check areas. Other scientists need them as sources for many kinds of plants and animals that are extinct everywhere else. The areas will provide a last refuge for these species, many of which are not yet well known to science. The tracts will serve an important educational role in carrying a heritage of the past down through the years so that future generations may know what the land is really like. Children will use them as places in which to gain a firsthand knowledge of the living world.

The work of saving these natural features is already being done by a number of local societies scattered about the country. The Nature Conservancy will be a stable organization which can aid these groups in financial, legal, and technical matters. It will thus create a coordinated national program.

The Nature Conservancy will be under the direction of a board of trustees that will include elected members and representatives of the Smithsonian Institution, the National Academy of Sciences, and three federal departments.

The bill, H.R. 8613, was referred to the Committee on Merchant Marine and Fisheries where it will be considered by the Wildlife Subcommittee.



SPINE CHATS

LADISLAUS CUTAK



How fast time flies! It seems only yesterday that I started SPINE CHATS but with this issue am embarking on the tenth year of continuous publication. I intend to continue the page as long as the readers demand it. So far nobody has 'knocked' SPINE CHATS, at least not to my knowledge, but instead I have received many complimentary comments which prompt me to continue them. Look for me at the familiar spot in the JOURNAL and do not hesitate to send in your comments and criticisms, which will always be appreciated.

* * *

Peter C. Duisberg, chemist in the New Mexico A. & M. College, made a brief survey of the field of desert plant utilization in *THE TEXAS JOURNAL OF SCIENCE* (4: 269-283, Sept. 1952). In the well illustrated article he has stated that obviously desert plants will provide increasing economic value during the coming years. A number of desert plants have yielded various alkaloids, essential oils and saponins. However, considerable work remains to be done to evaluate the possibilities of utilizing these substances. Further, there are many desert plants which have never received any chemical study. Being interested in the economic value of various xerophytes I learned a few facts which I did not know before. For instance, there is the statement that between one and two tons of blossoms are collected annually to produce a yucca perfume. The same amount goes for Prickly Pear (*Opuntia*) blossoms which go into making a cactus perfume. I have contacted several leading perfume manufacturers in the past to learn whether any of the cacti and succulents are employed in perfumery, particularly those whose florid advertisements show some exotic desert plant or exciting desert background, only to be given a vague reply that it was a trade secret.

The yucca plant is likewise the basis for several other small businesses. During the last war yucca was used by the Navy in the manufacture of a special Kraft paper. Firesticks made from the yucca flower-stalks have been manufactured for the Boy Scouts of America, who have spent \$20,000 for them in the last five years. During the First World War *Yucca glauca* was successfully used to make 80 million pounds of fiber for burlap and bagging. The leaves of another allied plant, *Nolina microcarpa*, have been converted into an excellent substitute for broom straw, especially useful in industrial and warehouse brooms because of its durability. These are but a few interesting facts culled from Duisberg's article.

* * *

A very dear friend of mine passed away last August 9th in her eighty-third year. She was Edith Lay Geitz, beloved wife of Dr. H. A. Geitz, a practicing physician in Old Mexico for more than forty years. It was the Geitzes who first introduced me to the fascinating country below the Rio Grande, back in 1939. In early May of that year I had met this charming couple at Shaw's Garden and was induced by them to come to Mexico to see the wonderful cactus regions in and around Monterrey, their home town. Two months later, Gus Bantel and I were enjoying the best thrill of our lives, visiting such well known cactus collecting

grounds as Rinconada, Ojo Caliente, Higueras, Arteaga, Carneros and many others. Either Mrs. Geitz or the genial Doctor accompanied us on many of these trips or they had instructed their good friend, Remo Damm, to guide us to places where the cacti were lush. The late Mrs. Geitz maintained a varied collection of cacti and succulents atop the Hotel Colonial, which was her great source of pride and joy, for she did not care much for social life. She started collecting in 1937, many of her plants coming from the Rinconada section where several Britton & Rose types originated. Edith Lay Geitz was born in Washington, D. C., on June 10, 1869.

* * *

There are many current political squabbles in the news today. One of them involves Egypt and the British Empire. The former has designs on controlling the Suez Canal and of acquiring the Anglo-Egyptian Sudan. Recently the second volume of "The Flowering Plants of the Anglo-Egyptian Sudan" by F. W. Andrews was published (Oct. 1952) and I thought our readers might be interested in what kind of spurge and asclepiads can be found in that country. Andrews lists 35 species and varieties of *Euphorbia*, 1 *Synadenium*, 2 *Brachystelma*, 7 *Caralluma*, 3 *Ceropogia*, 1 *Duvalia*, 1 *Huernia*, 1 *Echidnopsis* and 1 *Sarcostemma*. Some of the spurges are weedy annuals but there are a number of succulent trees and shrubs as well as cactus-like perennials which are of interest to our specialists. One of the largest trees is *Euphorbia candelabrum* which attains a height of 30 feet. Another massive spurge is *E. abyssinica*. We have a 10-ft. specimen in the Garden's South African House which I raised from seed in 1933 and it is the envy of all visitors. It is now beginning to form lateral branches. *E. Tirucalli* and *E. seke* are also large shrubs or trees, the former with abundant spineless cylindric fleshy branchlets only a half-inch in diameter and the latter with spiny 4-angled succulent green branches. *E. monacantha*, *E. Thi*, *E. venefica* and *E. infausta* are much-branched leafless spiny succulent bushes while *E. nubica*, *E. consobrina* and *E. Schimperiana* are unarmed succulents. Among the native asclepiads the three *Ceropogias* (*nilotica*, *racemosa* and *stenantha*) are slender glabrous twiners while the stapheliads like *Caralluma*, *Huernia*, *Duvalia* and *Echidnopsis* are small cactus-like herbs.

* * *

The dry by-product leaf powder from an Arizona yucca fiber factory may prove to be a large-scale source of the steroid *sarsapogenin*, which has recently been named as a potential cortisone precursor. This possibility arises from a finding that the leaf powder contains 0.5 to 1.0 per cent of the steroid. The discovery was made during the course of an investigation of plant sources for cortisone precursors by chemists of the government's Eastern Regional Research Laboratory. Sarsapogenin is easily isolated and purified by methods developed at the laboratory. The leaf powder, which is finely ground and ready for extraction as it comes from the factory, can be produced at a rate of 300,000 pounds monthly.

"CEREUSLY SPEAKING" continued from page 18

from mid-December on with yellow stars all up and down the stems until it is yellow instead of green. Pretty under a magnifying glass. Pieces of the Crassula take root into any pot you let them fall. I use them as gift items for beginners.

To add contrast to the small colorful blooms I've already mentioned, remember the Haworthias are the "Christmas lilies." I like *H. minima*, *pilifera*, *Haageana* and *tesselata* and its varieties. Some of the blooms are larger than others on short stems with a few of the *H. tesselata* and its hybrids with definite "lily-like perfume." (There are a few others I've marked for this also.)

An old fashioned favorite *Aptenia cordifolia* (purplish red flower), *Mesembryanthemum roseum* (rose pink) and *M. conspicuum* (rich iridescent purple) bloom for me during winter if I let them rest in late summer and water sparingly until buds appear. *Ceropegia Woodii*, *Barkleyie*, *Coformum* and *debilis* usually have blooms, dainty little lanterns of off-shades of reddish-purple. *Senecio stapeliaformis* (orangey tuft on a long stem), *Kleinia articulata* and *pendula* bloom here too with yellowish white and brilliant scarlet stalks when kept on the dry side.

Euphorbia splendens if rested for a short time in August and September responds with a long period of bloom from December to March, both in the window garden and greenhouse. I usually try to have it retain some of its fresh green leaves to supplement the orangey-pink flowers.

I usually have several Gasterias in bloom from mid-December through April. Again not spectacular but colorful in a dull season. I still have some Euphorbia subspecies which have reed-like stems and white to pink clusters of five petaled flowers up and down the stems. Another with leaves like a shrub, and blooms on long stems of greenish orange. Another that blooms at this time is sold in florist shops; a long stem with lance-shaped leaves and brilliant red-orange flowers along the stem. It is easily rooted from cuttings from a bouquet. All in all there is no end to small flowered plants of cacti and succulents but I like the small flowered ones after the summer and fall flowers of *Epiphyllum* (species and hybrids), *Selenicereus*, *Hylocereus*, *Cereus* (columnar), *Helicocereus*, *Echinocereus*, *Echinocactus*, *Stapeliads*, etc. The magnifying glass should be kept handy to study the flowers, fruit, seeds, etc., of our mutual hobby. We are too prone to be "size-conscious neglomaniacs." We need to restore ourselves to a saner balance of the minute as well as the grandiose.

Our scientists are dealing with virus which must be magnified 200,000 times to be even a hazy spot on the screen. Our doctors are using anti-biotics of the most minute size. I invite you to take a glass of some power and work at that masterpiece you have overlooked and be one of those who see color in "our-dab-world" again.

Sounds like a hodge-podge of plants, colors, sizes, shapes and what have you. It's all there in your window garden, dish garden, etc.

I shall attempt another batch of your letters regarding color, blooms, size, shape, etc., for my next article. Write.

JOHN E. C. RODGERS
1229—8th Street, Lorain, Ohio.

▲ ▲ ▲

Books purchased from this office helps support your JOURNAL. Send for 1952-53 book list.

FROM MEXICO

My new Cacti Price List of 1953 has just been finished. It contains a good number of new discoveries. If you really are interested in rare Cacti, just write for my list to:

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Britton and Rose Reprint.

University of Arizona Bulletin, April 1, 1933. Arizona Cacti by William Palmer Stockwell and Lucretia Breazeale.

U. S. Dept. of Agriculture No. 66, Cacti by David Griffiths and Charles Henry Thompson.

Amateur Bulletin of the Cactus and Succulent Journal.

Cactus Culture for the Amateur, published by The Callander Cactus Co., Springfield, Mo.

Cactus and How to Grow Them by The Francis E. Lester Co., Mesilla Park, New Mexico.

MRS. J. H. CARR, Box 413, ATASCADERO, CALIF.

IMPORTANT NOTICE

Prices of all books listed in our 1952-1953 price-list, as well as those advertised in this Journal, will advance in price on February 15, 1953. Please add 10% to all listed prices. No wholesale discount on single orders.

"Cacti for the Amateur" will advance to \$3.50

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NEW MAMMILLARIA LIST

"List of Specific Names and Synonyms of Mammillarias" by E. Shurly, 94 pg. mimeo. published by International Organization for Succulent Plant Study, J. D. Donald, secy., 3 Braeside Ave., Brighton 6, England. Limited number of copies \$2.20. Subscription to "Repositorium Plantarum Succulentarum" \$1.50 per annum—same address.

